

## DESCRIPTION OF THE COURSES

- Course code: ELR 2364
- Course title: Static convertors - applications
- Language of the lecturer: polish

| <i>Course form</i>                   | <i>Lecture</i> | <i>Classes</i> | <i>Laboratory</i> | <i>Project</i> | <i>Seminar</i> |
|--------------------------------------|----------------|----------------|-------------------|----------------|----------------|
| <i>Number of hours/week*</i>         | 1              |                | 1                 |                |                |
| <i>Number of hours/semester*</i>     | 10             |                | 10                |                |                |
| <i>Form of the course completion</i> | Pass           |                | Pass              |                |                |
| <i>ECTS credits</i>                  | 1              |                | 1                 |                |                |
| <b>Total Student's Workload</b>      | 30             |                | 30                |                |                |

- Level of the course (basic/advanced): advanced
- Prerequisites: Power electronics
- Name, first name and degree of the lecturer/supervisor: Stanisław Szkółka; Ph.D.
- Names, first names and degrees of the team's members: Józef Borecki, Ph.D.; Waldemar Dołęga, Ph.D.
- Year:.....IV..... Semester:.....7.....
- Type of the course (obligatory/optional): obligatory
- Aims of the course (effects of the course): the applications of converters in industry
- Form of the teaching (traditional/e-learning): traditional
- Course description:  
Selected applications of converters in industry. Influence of line-commutated converters on a power network. Uninterruptible power supply systems. Static converters in DC and AC drives. Static DC drivers of synchronous machines. Fast acting compensators of reactive power. Static convertors as a fault source in the power systems. Static convertors in the HVDC transmission of electrical energy
- Lecture:

| Particular lectures contents |   | Number of hours |
|------------------------------|---|-----------------|
| 1.                           | Basic AC and DC regulators  | 0,5             |
| 2.                           | Static convertors for inductive heating.                            | 0,5             |
| 3.                           | Static convertors in DC drives.                                     | 1               |
| 4.                           | Static convertors in AC drives.                                     | 1               |
| 5.                           | Soft – Start convertors.  | 0,5             |
| 6.                           | Static convertors in the HVDC transmission of electrical energy.    | 0,5             |
| 7.                           | Uninterruptible power supply systems – requirements and structures. | 1               |
| 8.                           | Static DC drivers of synchronous machines.                          | 1               |
| 9.                           | Influence of line commutated convertors on a power network          | 1               |
| 10.                          | Decreasing influence convertors                                     | 0,5             |
| 11.                          | Electrical network harmonic filters                                 | 0,5             |
| 12.                          | Fast acting compensators of reactive power.                         | 0,5             |

|   |   |     |
|---|---|-----|
| 13.   | Develop tendencies of static convertors                         | 0,5 |
| 14.   | Pass  | 1   |
| <ul style="list-style-type: none"> <li>• Classes – the contents:</li> <li>• Seminars – the contents:</li> <li>• Laboratory – the contents: 4 exercises</li> </ul> |   |     |
| 1.  | Fast acting compensators of reactive power                      | 2   |
| 2.  | Static convertors in the HVDC transmission of electrical energy | 2   |
| 3.  | Influence of line commutated convertors on a power network      | 2   |
| 4.  | 12-pulse rectifiers   | 2   |

- Project – the contents:
- Basic literature:

1. A. M. TRZYNADLOWSKI, INTRODUCTION TO MODERN POWER ELECTRONICS; 1998
2. DANIEL W. HART, INTRODUCTION TO POWER ELECTRONICS; 1997
- THOMAS H. BARTON, RECTIFIERS, CYCLOCONVERTERS, AND AC CONTROLLERS; 1994
3. Leistungselektronik – VEM Handbuch; VEB Verlag Technik Berlin 1978.
4. H.Supronowicz "Poprawa współczynnika mocy układów przekształtnikowych", WNT Warszawa 1981r.
5. P. Büchner "Stromrichter-Netzrückwirkungen und ihre Beherrschung" Auflage VEB Deutscher Verlag für Grundstoffindustrie, Leipzig 1982.
6. B.M. Bird & K.G. King „An Introduction to Power Electronics” 1983 by J. Willey & Sons Ltd

- Additional literature:

1. JAYANT BALIGA, POWER SEMICONDUCTOR DEVICES; 1996
2. LASZLO TIHANYI, ELECTROMAGNETIC COMPATIBILITY IN POWER ELECTRONICS, 1995

- Conditions of the course acceptance/creditation:  
Passing grades of quizzes

\* - depending on a system of studies